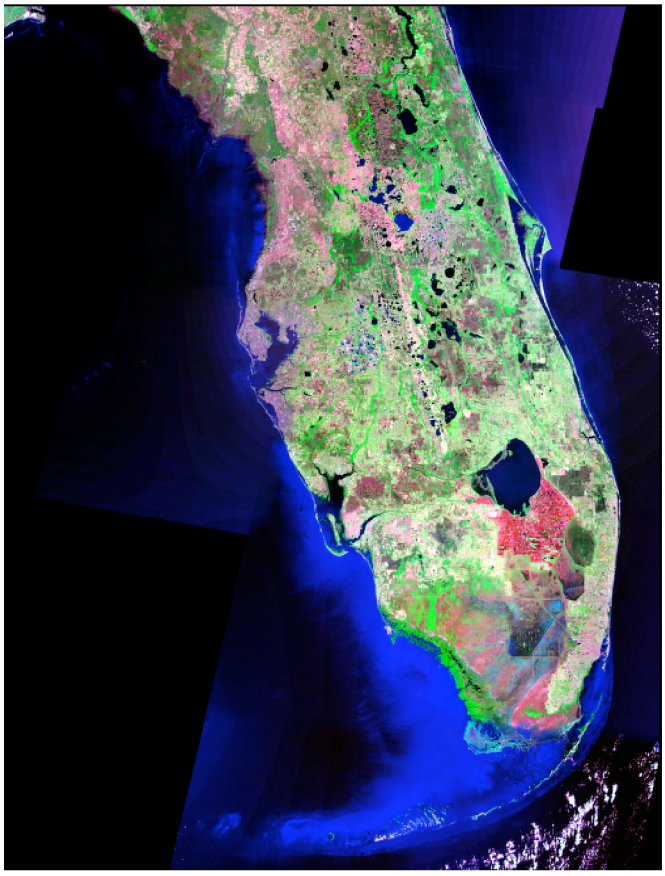
Developing a Florida Shallow-water Coral Ecosystem Mapping Implementation Plan–Summary of initial workshop discussions

The NOAA Coral Ecosystem Mapping Team held workshops in St. Petersburg and Miami, Florida during the week of November 1, 2004 to gather information from state, federal, university, and other partners that will be used to develop a Florida Shallow-water Coral Ecosystem Mapping Implementation Plan (MIP). When completed by July 2005, the MIP will describe mapping and geographic area requirements, identify mapping and geographic priorities, and provide cost estimates for completing benthic habitat characterizations of Florida's coral ecosystems. The NOAA Coral Reef Conservation Program and NOAA's National Ocean Service are providing support to develop this MIP.

A tropical coral ecosystem is composed of both habitats and structural zones. Benthic habitats found in a coral ecosystem include unconsolidated sediments (e.g., sand and mud), mangrove, submerged vegetation (e.g., seagrass and algae), hermatypic coral reefs and associated colonized hard bottom habitats (e.g., spur and groove, individual and aggregated patch reefs, and gorgonian-colonized pavement and bedrock), and uncolonized hard bottom (e.g., reef rubble and uncolonized bedrock). Typical structural zones include the reef crest, fore reef, reef flat, and lagoon.



The shallow-water benthic habitats of southern Florida have not been comprehensively mapped since the publication of the Florida Fish and Wildlife Research Institute's 1998 atlas of the Benthic Habitats of the Florida Keys. The maps depicted in that atlas were derived from aircraft imagery acquired in 1991-1992. Since the publication of the atlas, benthic habitat maps of Florida Bay and portions of the Dry Tortugas, the West Florida Shelf, and Florida's south Atlantic coast have been developed. These maps have been developed using imagery from different technologies, different classification schemes to identify the benthic habitats, and different techniques to generate the actual maps. More importantly, significant changes have taken place in the coral ecosystems of southern Florida during the years since many of the maps were produced. In addition, no comprehensive, shallow-water bathymetry map of southern Florida is available. As a result, there is a need for consistently derived, accurate shallow-water (0–40 m) benthic habitat maps of southern Florida derived from contemporary imagery. There also is a need for shallow to moderate depth (0–200 m) bathymetric data of southern Florida.

Participation

The workshops were held in St. Petersburg and Miami, Florida and were attended by representatives from the following agencies, universities, and organizations:

- Florida's Department of Environmental Protection
- Florida's Department of Transportation
- Florida's Fish and Wildlife Conservation Commission
- University of Miami
- University of South Florida
- University of Central Florida
- Nova Southeastern University
- National Aeronautics and Space Administration
- U.S. Geological Survey
- National Park Service
- The Nature Conservancy
- South Florida Ecosystem Restoration Task Force
- NOAA's Office of Oceanic and Atmospheric Research
- NOAA's National Marine Fisheries Service
- NOAA's National Ocean Service

Outcomes

Discussions at the workshops resulted in the following key messages:

1. There is critical need to develop new, more accurate, synoptic maps of the benthic habitats of Florida. The new maps should be derived from recently-acquired imagery and should, to the extent possible, mimimize unknown or unmappable areas.

2. There is a need to define geographic limits on the Florida coral ecosystem mapping project based on conservation and management requirements and the costs of data collection and map production. The priority geographic area in southern Florida is estimated to cover over 30,000 sq km. and extends along the Gulf of Mexico coast to Tarpon Springs, Florida and along the Atlantic Coast to St. Lucie Inlet, Florida. The secondary priority area includes the entire state of Florida.

3. There is a need to define the depth regime that should be characterized based on conservation and management and the cost of data collection and map production. The priority depth regime extends from the shoreline out to 40 m (~22 fathoms). The secondary priority depth regime extends out to 200 m (~109 fathoms).

4. There is a need to inventory existing and planned coral ecosystem and bathymetry mapping efforts in Florida. Florida's Fish and Wildlife Research Institute will coordinate the inventory and develop a web-based GIS capability to display mapping activities.

5. There is a need to evaluate whether or not existing Florida coral ecosystem maps can be included in a new map product. Concerns were raised about whether or not currently available maps from disparate sources can be compiled together to produce a consistent, accurate map. New and comprehensive data collection may be the most cost-effective way to produce timely, accurate coral ecosystem maps.

6. The maps of Florida's coral ecosystems should be 85-95 percent accurate, depending on the type of benthic habitat being characterized. Map accuracy is of greater importance than map detail. If choices must be made between accuracy and minimum mapping unit (the size of smallest benthic habitat feature identified), the priority is on map accuracy.

7. There is a need to produce both bathymetric maps and benthic habitat maps for priority geographic areas and depth regimes. A suite of technologies, including airborne imaging technologies, high-resolution satellite imagery, aircraft-based LIDAR (LIght Detection and Ranging) imagery, and ship-based acoustic imagery (e.g., multibeam sonar), will be needed to collect the data.

8. There is a need to ensure resource commitments to the mapping effort from federal, state, academic, and private sector partners. No single organization has the financial resources to complete coral ecosystem and bathymetric maps of southern Florida. Commitments need to be maintained for the estimated 3-4 year duration of the mapping effort.

9. There is a need to develop a hierarchical, sensor-dependent benthic habitat classification scheme. Several schemes exist and may require only minor modification, based on the strengths and weaknesses of the technologies that will provide the imagery used to generate the maps.

10. There is a need to assess whether or not synoptic benthic habitat maps can be generated from LIDAR and acoustic imaging technologies. Currently, these technologies and their associated backscatter informaiton have only been used to map small areas. In addition, procedures need to be developed that describe how to generate accurate, synoptic benthic habitat maps in both shallow (0–40 m) and moderately deep (40–200 m) water using these technologies.

11. A Steering Committee has been established to lead the development of the MIP. The Steering Committee is composed of representatives from Florida's Department of Environmental Protection, Florida's Fish and Wildlife Conservation Commission, the University of Miami, the University of South Florida, Nova Southeastern University, the National Aeronautics and Space Administration, the U.S. Geological Survey, the National Park Service, the Nature Conservancy, and NOAA.

Next Steps

1. Identify other stakeholders, such as marine life collectors, local fisherpersons, representatives from the dive community, coastal zone managers, and researchers that could be interested in the development of bathymetric and benthic habitat maps of southern Florida.

2. Complete the MIP by July 2005. The MIP will be used to support a request in FY06 for funding through NOAA's Coral Reef Conservation Program. The MIP also may be used to support requests for funding through other federal agencies and the state of Florida. The objective is to initiate Florida coral ecosystem mapping activities during FY06.

3. Convene a workshop to develop a hierarchical, sensor-dependent benthic habitat classification scheme for southern Florida.

4. Set up a website to support the mapping project. The website will be used to post status reports, exchange information, provide input, and track progress.

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